Appendix J
Fish Passage Summary (NMFS Simpass Modeling)

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MEMO FOR: FCRPS Files

FROM: Gary **Fredricks**

SUBJECT: Assistance *for* the *Corps'* 2002 mG Modification Reque$t

NMFS has been asked by the CQrPS for technical assistance in answering the Oregon Department of Environmental Quality (ODEQ) Commission's request for an estimate of the difference in juvenile salmon survival due to the issuance of a total dissolved gas standard modification for the lower Columbia River. This issue was previously addressed, at the ODEQtommissions' request, in our 1996 Annual Report to the ODEQ (pages 29 -36). In that report we discussed the problems with achieving an empirical estimate of spill survival, primarily due to the multi-variate nature of empirical survival es~ates, as well as the difficult and potential adverse fish survival impacts inherent in conducting a specific project level survival study for different spill levels. Because of these problems, we lJ.sed the Simpas model as a tool fQr illustrating the differences in project sUrVival due to different spin levels. While we now have more reach and system survivaJ information, the problems of separating cause and effect t:emain and the basic rationale for using a simulation model outlined in the 1996 report are still valid. Because of this we will continue to use the Simpas model (as documented in Appendix D of the 2000 FCRPS Biological Opinion) for estimating juvenile fish survival differences of various types of operational actions or configuration changes.

Since the 1996 effort, several important input parameters that effect dam passage survival have changed. These are well documented in Appendix D of the 2000 Biological Opinion. Inputs for the current exercise include the 2000 BiOp juvenile steelhead, yearling (spring and summer) and subyearling (f~) chinook dam passage and survival input parameters, representative spring and summer flows and 1995 (average flow year) pool survivals. The 110% TDG spill levels were taken from the Corps' 2001 DGAS Phase II report. The 120% TDG spill levels were taken from the 2000 BiOp with modifications based on 2000 and 2001 spill observations (e.g., the John Day spill levels are higher than listed in the BiOp and the Bonneville spill levels are lower).

The difference in system inriver survival estimates from the Simpas model illustrates the expected survival difference between the 120% and 110% TDG spill levels. This parameter estimates the overall inriver swvival of the juvenile popUlation of the species in question from the head of Lower Granite Pool to saltwater below Bonneville Dam and is the same estimate NMFS used to establish 2000 FCRPS Biological Opinion inriver s~rvival performance st~dards. To isolate the effects of spill changes, only the spill volumes were changed between model runs. The increase in inriver survival demonstrates how the spill program helps achieve the BiOp inriver survival performance standards for each species.

Steelhead: Estimated system inriver survival increased from 43.9% to 50.0%, a difference of 6.1% and a relative survival increase of 13.9% over the 110% spill condition.

Yearling **Chinook:** Estimated system inriver survival increased from 38.1 % to 42.8 %, a difference of 4.7% and a relative survival increase of 12.3% over the 110% spill condition.

Subyearling Chinook: Estimated system inriver survival increased from 16.0% to17.3 %, a difference of 1.3% and a relative survival increase of 8.1 % over the 110% spill condition. The subyearling chinook difference is smaller because fewer dams are spilling under the BiOp's summer transport operations.

The estimated relativ~ inriver survival increases reported here are higher than those reported in 1996 (5.8% for yearling chinook) primarily due to changes in our understanding of allowable 110% mG spill levels which resulteQ from investigations conducted by the Corps DGAS Program. That is, because the allowable 110% TDG spill levels were found to be lower, the relative change in survival is now greater than in 1996.

It should also be noted that the measured inriver survivals in 2001 were substantially lower than any of the above mentioned survival estimates. We believe this is largely due to the limited spill and low river flow levels experienced by the 2001 outmigration.

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